

**Dr. Duke's Phytochemical and Ethnobotanical Database**

**Chemicals Found in Humulus lupulus**

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
30	(+)-CATECHIN	Fruit	--	--		
38	(-)-EPICATECHIN	Fruit	--	--		
3	2-TRIDECANONE	Essential Oil	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	ACETONE	Flower	--	--		
3	ACETONE	Inflorescence	--	--		
3	ACETONE	Fruit	--	--		
2	ADHUMULONE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
2	ADHUMULONE	Plant	--	--		
2	ADHUMULONE	Inflorescence	--	--		
2	ADHUMULONE	Strobilus	--	--		
2	ADLUPULONE	Fruit	--	--		
2	ADLUPULONE	Plant	--	--		
2	ADLUPULONE	Inflorescence	--	--		
2	ADLUPULONE	Strobilus	--	--		
2	ALLO-CYMENE	Essential Oil	--	--		
3	ALPHA-CADINOL	Fruit	15	15		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	ALPHA-HUMULENE	Fruit	--	--		
2	ALPHA-HUMULENE	Essential Oil	--	400000	3.136732670792344	
28	ALPHA-PINENE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
28	ALPHA-PINENE	Essential Oil	--	--		
3	ALPHA-SELINENE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
23	ALPHA-TERPINEOL	Essential Oil	--	--		
32	ALPHA-TOCOPHEROL	Strobilus	--	--		
5	ALUMINUM	Fruit	4.7	4.7	-0.22215407810898732	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
5	ALUMINUM	Flower	0.9	4.7	-1.6412298738578974	
14	ARGININE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
112	ASCORBIC-ACID	Fruit	1782	1782	-0.17368960442994769	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
112	ASCORBIC-ACID	Flower	332	1782	-0.2861764494395231	
2	ASPARAGINE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
7	ASTRAGALIN	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
2	BETA-ALANINE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
53	BETA-CAROTENE	Fruit	2.4	2.4	-0.1461614723719775	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
53	BETA-CAROTENE	Flower	0.5	2.4	-0.5854376351911411	
13	BETA-EUDES MOL	Fruit	60	60		
2	BETA-MYRCENE	Essential Oil	420000	580000	1.706327614199298	
13	BETA-PINENE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
13	BETA-PINENE	Essential Oil	--	--		
13	BETA-PINENE	Plant	--	--		
3	BETA-SELINENE	Fruit	150	150	1	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
47	BETA-SITOSTEROL	Plant	--	--		
102	CAFFEIC-ACID	Plant	--	--		
28	CALCIUM	Fruit	6222	6222	0.545912951542125	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
28	CALCIUM	Flower	1157	6220	0.12434337429806096	
2	CAMPESTEROL	Stem	--	--		
8	CANNABIDIOL	Leaf	--	--		
31	CARYOPHYLLENE	Plant	--	--		
6	CARYOPHYLLENE-EPOXIDE	Fruit	24	24		
8	CARYOPHYLLENE-OXIDE	Essential Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
43	CATECHIN	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
1	CELLULOSE	Stem	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
77	CHLOROGENIC-ACID	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
20	CHOLINE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
24	CHROMIUM	Fruit	7	0.7	-0.4093125277624259	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
24	CHROMIUM	Flower	0.1	0.7	-1.0719973021906593	
53	CITRAL	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
53	CITRAL	Essential Oil	--	--		
2	COBALT	Fruit	24	2.4	-0.24457299524657042	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
2	COBALT	Flower	0.5	2.4	-0.41850902895210695	
2	COHUMULONE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
2	COHUMULONE	Strobilus	--	--		
2	COHUMULONE	Plant	--	--		
2	COHUMULONE	Inflorescence	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	COLUPULONE	Fruit	--	--		
3	COLUPULONE	Plant	--	--		
3	COLUPULONE	Strobilus	--	--		
3	COLUPULONE	Inflorescence	--	--		
7	CYANIDIN	Plant	--	--		
1	DECAN-1-AL	Essential Oil	--	--		
9	DELPHINIDIN	Plant	--	--		
9	DELTA-CADINENE	Fruit	60	60	-0.4584564235430147	
1	DELTA-CADINOL	Fruit	36	36	1	
2	DIETHYL-AMINE	Flower	--	3.1		
2	DIETHYL-AMINE	Inflorescence	3.1	3.1		
2	DIMETHYL-AMINE	Flower	--	1.4	-0.9999999999999997	
2	DIMETHYL-AMINE	Inflorescence	1.4	1.4		
1	DIMETHYLVINYLCARBINOL	Flower	--	--		
7	DIPENTENE	Fruit	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
40	EPICATECHIN	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	ESTRADIOL	Fruit	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
8	ESTRONE	Fruit	--	--		
76	EUGENOL	Essential Oil	--	--		
2	FARNESENE	Essential Oil	--	--		
17	FARNESOL	Fruit	17	17	-0.6852064014620585	
17	FARNESOL	Essential Oil	--	--		
61	FERULIC-ACID	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
15	FIBER	Fruit	72000	72000	-0.6574998263757718	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
12	FORMALDEHYDE	Fruit	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
2	FRIEDELIN	Stem	--	--		
8	FRUCTOSE	Fruit	15000	20000	-0.617530686348938	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
22	GAMMA-AMINOBUTYRIC-ACID	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
20	GAMMA-LINOLENIC-ACID	Seed	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
8	GENTISIC-ACID	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
35	GERANIOL	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
35	GERANIOL	Essential Oil	--	--		
5	GERANYL-ACETATE	Essential Oil	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
2	GERANYL-PROPIONATE	Essential Oil	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
2	GERMACRENE-D	Fruit	15	15	-1	
7	GLUCOSE	Fruit	15000	20000	-0.6828399338718176	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
9	HEDERAGENIN	Stem	--	--		
1	HEPTYLISOBUTYRATE	Essential Oil	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
7	HISTIDINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
2	HUMULENE	Fruit	1200	1200	1.4104326443879445	
2	HUMULENE	Plant	--	--		
2	HUMULENE	Essential Oil	--	--		
2	HUMULENE	Flower	--	--		
16	HUMULONE	Flower	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
16	HUMULONE	Plant	--	--		
16	HUMULONE	Strobilus	--	5000		
16	HUMULONE	Fruit	--	--		
16	HUMULONE	Inflorescence	--	--		
6	IRON	Fruit	--	--		Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
6	IRON	Flower	--	--		
2	ISOHUMULONE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	ISOLEUCINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
22	ISOQUERCITRIN	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
5	ISOVALERIC-ACID	Essential Oil	--	--		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
6	ISOXANTHOTHUMOL	Fruit	1837	1838		
6	ISOXANTHOTHUMOL	Resin, Exudate, Sap	--	42500		
75	KAEMPFEROL	Leaf	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
2	KAEMPFEROL-3-RHAMNOSIDE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	LEUCINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	LEUCOCYANIDIN	Flower	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
1	LEUCOCYANIDIN	Leaf	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
2	LEUCODELPHINIDIN	Flower	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
2	LEUCODELPHINIDIN	Leaf	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
13	LIGNIN	Stem	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
60	LIMONENE	Fruit	--	--		
60	LIMONENE	Essential Oil	--	--		
53	LINALOOL	Fruit	--	--		
53	LINALOOL	Essential Oil	--	--		
4	LUPULIN	Fruit	--	--		
9	LUPULONE	Flower	--	--		
9	LUPULONE	Inflorescence	--	--		
9	LUPULONE	Fruit	--	--		
9	LUPULONE	Strobilus	--	1300		
9	LUPULONE	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	LYSINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
65	MAGNESIUM	Fruit	2380	2380	0.11588638233919304	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
65	MAGNESIUM	Flower	443	2380	-0.3123747135433822	
2	MALTOSE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
14	MANGANESE	Fruit	81	8.1	-0.3501271465981358	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
14	MANGANESE	Flower	1.5	8.1	-0.36407539187837923	
6	MASLINIC-ACID	Stem	--	--		
1	METHYL-AMINE	Flower	3.7	3.7	-1	
2	METHYL-NONANOATE	Essential Oil	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	METHYL-NONYL-KETONE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
22	MYRCENE	Fruit	--	--		
22	MYRCENE	Essential Oil	--	--		
22	MYRCENE	Strobilus	--	--		
22	MYRCENE	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
22	MYRCENE	Inflorescence	--	--		
34	MYRICETIN	Plant	--	--		
2	NEO-CHLOROGENIC-ACID	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
10	NEROL	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
10	NEROL	Essential Oil	--	--		
11	NEROLIDOL	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
39	NIACIN	Fruit	--	435	5.003766647644194	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
39	NIACIN	Flower	81	435	3.352263480595522	
64	OLEANOLIC-ACID	Stem	--	--		
25	P-COUMARIC-ACID	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
16	P-CYMENE	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
24	PECTIN	Fruit	120000	140000	1.0319193042672525	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
7	PHENYLALANINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	PHOSPHORUS	Fruit	4760	4760	0.4689758575548939	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
4	PHOSPHORUS	Flower	885	4760	0.44165313354460856	
10	PIPERIDINE	Flower	--	2.5		
10	PIPERIDINE	Inflorescence	2.5	2.5		
14	POTASSIUM	Fruit	20350	23500	0.49399185392198836	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
14	POTASSIUM	Flower	4371	23500	0.43388681236779714	
1	PROCYANIDIN-B-1	Fruit	--	--		
1	PROCYANIDIN-B-2	Fruit	--	--		
2	PROCYANIDIN-B-3	Fruit	--	--		
4	PROCYANIDIN-B-4	Fruit	--	--		
27	PROCYANIDINS	Fruit	--	--		
1	PYRROLIDINE	Flower	--	1		
1	PYRROLIDINE	Inflorescence	1	1		
176	QUERCETIN	Plant	--	--		
2	QUERCETIN-3'-GLUCOSIDE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	QUERCETIN-3-O-RHAMNOSIDE	Fruit	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
44	QUERCITRIN	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
1	RAFFINOSE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
15	RIBOFLAVIN	Fruit	10	10	1.0688416055697534	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
15	RIBOFLAVIN	Flower	2	10.1	0.9131195269275587	
87	RUTIN	Fruit	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
87	RUTIN	Leaf	2000	2000	-0.8803806294985641	
60	SELENIUM	Fruit	--	1.7	0.03537263271054239	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
60	SELENIUM	Flower	0.3	1.7	-0.5395561278850259	
1	SERINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
4	SILICON	Fruit	45	4.5	-0.5938225414098025	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
4	SILICON	Flower	0.8	4.5	-0.5633927701595145	
1	SODIUM	Fruit	47	47	-0.17949382924161622	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
1	SODIUM	Flower	9	47	-0.5922029574106819	
10	SQUALENE	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	STACHYOSE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
12	STIGMASTEROL	Stem	--	--		
14	SUCROSE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
31	THIAMIN	Fruit	3.4	3.4	-0.24739706588262703	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
4	THREONINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
4	TIN	Fruit	22	22	-0.2908840013040884	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
4	TIN	Flower	4	22	0.9878291611472616	
2	TRANS-BETA-FARNESENE	Tissue Culture	--	--		
1	TRIMETHYLAMINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
29	TRYPTOPHAN	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
8	TYROSINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
89	URSOLIC-ACID	Stem	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	VALINE	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	VIRIDIFLOROL	Fruit	16	16		
4	XANTHOTHUMOL	Fruit	15	15		
4	XANTHOTHUMOL	Strobilus	--	300		
4	XANTHOTHUMOL	Resin, Exudate, Sap	--	78750		
77	ZINC	Fruit	--	--		Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
77	ZINC	Flower	--	--		